

426/654

Refined Sugar as a Preserving Agent - Fairrie - "Sugar"  
(1st Ed.)

Copy Div. 43

-----

The power of preventing the fermentation and decomposition of fruits shown by strong sugar solutions has long been known and, although it cannot yet be asserted that the action is fully understood, a convincing theory has been developed as the result of our widening knowledge of the vital process of fermentation.

The yeast-cell, which causes fermentation (see page 199), consists of living matter (protoplasm) enclosed in a cell-wall through which water and certain dissolved substances can pass. Protoplasm requires water in order to live. When yeast develops in a fruit juice, wine, beer or similar liquid, where the proportion of dissolved matter is relatively small, no check is placed on its growth. But the avidity of a strong sugar solution for water is such that, when active yeast-cells and many kinds of bacteria are immersed in sugar syrup, water is drawn from the protoplasm through the cell-wall and the cell will entirely collapse due to external pressure, and can then no longer exercise its fermentative function. This "drying-up" action is known as plasmolysis and is the basis of the preservation of canned fruits, candied fruits, jams and condensed milk.

Preserved fruits contain about 50 per cent. of sugar; condensed milk contains from 40 per cent.  $\frac{5}{8}$  to 50 per cent. of sugar, depending on the grade, while jams contain around 70 per cent. of sugar. The keeping qualities of dried fruits are due to the removal of water and the concentration of the sugar contained in them.

Whilst a strong solution of refined sugar is one of the most valuable food-preserving agents available, a weak solution of sugar, exposed to the air, ferments, and, in the course of time, will generate most unpleasant odours, due to ~~the~~ the formation of butyric and lactic acids.